



WORLD CUBE ASSOCIATION

Official Report on WCA Competition Blindfold Solving of Mátyás Kuti

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1. Background and Introduction

The World Cube Association was formed in 2004 in an effort to set standards and regulations in the sport of speed cubing and also to organise the international community. Unlike most sports, though physically demanding, the top echelons of competitors come from a variety of ages, nationalities, and backgrounds.

Mátyás Kuti of Hungary broke into the competitive cubing scene at the Polish Open 2006. He won the blindfold event in the final round with a time of 3:23.74. At that time, the world record for solving a 3x3x3 blindfolded was 1:28.82. A time of 2:30 was considered quite competitive internationally, and the top blindfold solvers would routinely complete the cube in roughly 90 seconds.

Kuti continued his rapid ascent into the top levels of blindfold cubing. In every event leading up to the Belgian Open 2008, he placed first. Kuti dominated the sport and managed to solve the cube in half the time as the second place winner a total of five out of a total of 11 competitions. He set the world record twice, first with a time of 1:20.30, and then by setting the current world record with a time of 54.83. All Kuti results can be found at his profile at the WCA results page:

<http://www.worldcubeassociation.org/results/p.php?i=2006KUTI01>.

In the time before Kuti, the top three solvers in blindfold cubing were Chris Krueger, Leyan Lo, and Tyson Mao from the United States. All three had been competing with roughly similar results. A typical solve of about 1:45 would take 45 seconds of memorisation followed by 60 seconds of execution. Kuti's competition solves would shatter these conventions, as his memorisation phase was typically around 13 to 15 seconds, and would occasionally reach times of 8 seconds.

Kuti also performed well beyond any other known competitor with his times in the 4x4x4 blindfold solve, the 5x5x5 blindfold solve, and his results in the multiple blindfold event. At the Czech Open 2007, he solved a 5x5x5 Rubik's Cube blindfolded in 10:05.00. At Swedish Cube Day 2007, he solved a 4x4x4 Rubik's Cube blindfolded in 5:26.03. At the World Championships 2007, he set the world record for the multiple blindfold event by solving 15 cubes in a total time of 46:17. The second place results for the 5x5x5 blindfolded event and 4x4x4 blindfolded event are 19:55 and 6:20.96 respectively.

There was much inquiry into Kuti's methods as his results were revolutionary. These results were not conceivable with the current repertoire used by other top blindfold competitors. Top blindfold solvers started seeking ways to improve their memorisation techniques to match those of Kuti.

Until Belgian Open 2008, Kuti had a streak of 31 consecutive solves. The second place streak is 12 consecutive. The top ten blindfold solvers have an accuracy rate around 63%.

2. Regulation Changes of the WCA

It has been well demonstrated that the current blindfold regulations used by the WCA were not sufficient to prevent cheating. WCA Delegate Adam Zamora of the United States performed a solve, while wearing a blindfold, using a speed solve method at the California Institute of Technology to demonstrate this clearly. The audience could not see that he could actually see the cube. Blindfolds do not prevent the wearer from seeing things below eyelevel, and it is impossible to see where the competitor's vision is directed when the eyes are covered with a blindfold.

With this in mind, judges of the blindfold event were instructed to periodically obscure the line of sight from the competitor to the Rubik's Cube during the execution stage of the blindfold competition with the scorecard. This preventative measure was performed infrequently. The cohesiveness of the Rubik's Cube community encouraged judges and WCA delegates to rely on the good faith of competitors not to look under the blindfold during the execution stage of the solve.

As the WCA grows in both scope and size, it is impossible to assume that none of the competitors will take advantage of the system. Currently, more permanent solutions are being drafted to address this flaw in the blindfold competition regulations.

As a temporary solution to preserve the validity of the blindfold solving events, the judge will obscure the Rubik's Cube from the competitor's line of vision during the solving phase of each attempt. The judge must keep a paper sheet or a similar object between the face of the competitor and the puzzle.

Judges will take extra precautions to avoid distracting the competitor, but competitors must understand that such actions are necessary to prevent cheating and preserve the integrity of this sport.

3. Allegation of Cheating

The initial allegation that Kuti had been performing the execution phase of the blindfold solve with visual aid was first produced in the following post by Milán Baticz, also of Hungary: <http://speedsolving.com/showthread.php?t=2842>.

Baticz alleges that Kuti had been looking under the blindfold using visual aid to execute moves on the Rubik's Cube while supposedly blindfolded. Baticz cites Kuti's prior impeccable blindfold record, and noted that when Kuti's line-of-sight was obscured with a piece of paper, he would be unable to successfully complete a blindfold solve. Further evidence of this phenomenon was very notably provided in the following video of Kuti's third solve in the final round from the World Championships 2007 in Budapest, Hungary: <http://www.youtube.com/watch?v=0sSqbdCYUXw>.

As the judge's hand obscures the line-of-sight, Kuti halts his execution. In theory, the judge's silent actions should have no effect on Kuti's solves as he would be unable to see

the judge move his hand. Kuti's pause in execution was unprecedented, as he had previously completed nearly 30 consecutive solves blindfolded with nearly impeccable execution.

Members of the online community have cited in voluminous amounts both evidence that supports and refutes the allegation of cheating against Kuti. The WCA disregards all evidence regarding these allegations against Kuti in its analysis and decision. The evidence brought forth by Baticz was deemed unnecessary during the course of the investigation by the WCA.

It is noted that the allegations by Baticz made no comment on Kuti's legitimate abilities as a competitor in the blindfold events. Kuti has amassed quite possibly the most decorated résumé of any WCA competitor in the history of the organisation, and has shown a deep passion for the sport and an advanced capacity for learning and innovation. The WCA makes no effort to determine the scope of Kuti's legitimate abilities, and instead only focuses on the integrity of past events.

The WCA does not investigate all accusations of fraud from the community. The video of Kuti's third solve at the World Championships 2007 in Hungary exceeded the tolerance threshold of the WCA, and thus this case warranted further investigation.

The design of the procedure of blocking the line of sight of the puzzle from the competitor during the execution phase of a blindfold solve was designed to evoke the behaviour exhibited by Kuti during the last solve of the final round of the 3x3x3 blindfold competition. Whereas the behaviour and reactions exhibited by Kuti were possibly the result of memory lapses and coincidences, it was difficult for the WCA to ignore that an act of fraud in the blindfold event evokes the exact response by Kuti in the video.

4. Analysis of Evidence

Because of Kuti's reputation and accomplishments, conclusive evidence was required to elicit reaction and formal comment from the WCA.

4.1 Reconstruction of successful blindfolded solves

Analysis was first performed on solve 2 from the Czech Open 2007. The total time of the solve was 55.04. A video can be found here:

<http://youtube.com/watch?v=nqZWVT82Ekc>. A high resolution video of this solve can be found here: <http://rapidshare.com/files/90038633/Untitled.mpg.html>.

Memorisation of the Rubik's Cube state took between 16 and 17 seconds. The scrambles from the competition were not available, but were derived through video analysis.

In blindfold solving, competitors generally define a top colour and a front colour for personal reference. Kuti uses white as his top, and blue on the front. With a solved Rubik's Cube holding white as the top centre and blue as the front centre, perform the

following scramble on the cube to achieve the initial state of the second solve from the Czech Open 2007.

F2 D R2 U R2 U2 R2 D' L2 R2 B' R B L2 U B D L' D' B' U

The original scramble has four edges and two corners in their correct places. The following table illustrates the initial location of the pieces:

original scrambled state		
	position	piece
edges	UF	RD
	UL	FL
	UB	RF
	UR	UL
	FL	BL
	BL	UR
	BR	BR
	BF	UB
	FD	FD
	LD	LD
	BD	BD
	RD	UF
corners	UFL	UFL
	ULB	URB
	URB	DLB
	URF	ULB
	DFL	DRB
	DLB	DFL
	DRB	URF
	DRF	DRF

The execution phase of blindfold solving is possible because competitors solve sections of the cube in such a manner that do not alter the state of the rest of the cube. Blindfold solves have been completed that require constant rearranging of the cube state, but this is generally accomplished after long periods of memorisation.

A very popular method of blindfold solving involves four stages: orientation of the corners, orientation of the edges, permutation of the corners, and permutation of the edges. The orientation stages serve to set up invariant qualities on the Rubik's Cube that are maintained by limiting certain setup moves. More advanced methods have been developed where orientation and permutation are accomplished at the same time. In these methods, the setup moves serve to orient the piece correctly as it is permuted.

During each phase, the other set of pieces on the Rubik's Cube are left intact. It is impossible to analyse the after-effects of the more common F2L and OLL algorithms from the CFOP (Cross-First two layers-OLL-PLL) method in under 20 seconds with any known mental capacity. It is even more unbelievable to analyse the after-effects of

2x2x2 corner methods on a 3x3x3 blindfold solve as 2x2x2 methods have no regard for the effect on the edges of a 3x3x3 cube.

Kuti begins the execution of the solve by orienting the corners using the following set of moves:

D2 R2 U2 (R U R' U' x R' U R U') x U' (R U R' R U R' U' R U' R') x2 x2 U' (R U R' U' x R' U R U' x') x2

after orientation state?		compared to:
position	piece	Original
UF	RD	SAME
UL	LD	
UB	FL	
UR	RF	
FL	BL	SAME
BL	UR	SAME
BR	UB	
BF	BR	
FD	UF	
LD	BD	
BD	UL	
RD	FD	
UFL	DRB	
ULB	UFL	
URB	DFL	
URF	URB	
DFL	DLB	
DLB	URF	
DRB	URB	
DRF	DRF	SAME

antisune? R U R' R U R' U' R U' R'
 T oll?! (R U R' U' R' F R F')
 T oll is done with a cube turn (R U R' U' x R' U R U')

Typical corner orientation methods orient certain corners at the same time while leaving the rest of the cube, especially the edges, entirely intact. The above table compares the position of the corners and edges after the corner orientation.

Virtually all pieces have been permuted after the corner orientation. Such a mental adjustment is not known to be possible at this time, especially with only 16 seconds of memorisation. Furthermore, such shifting of the edge states during corner orientation is incompatible with the method described by Kuti about his blindfold solving technique during the World Championships 2007.

The algorithm in parenthesis, (R U R' U' x R' U R U'), is also emphasised as it is a well-known OLL in the CFOP method and is commonly used by 2x2x2 speed solvers to orient two corners. The algorithm performs a permutation on the edges, which is not considered during 2x2x2 and 3x3x3 speed solving.

Typical corner permutation methods also maintain invariance of the positioning of the edges. Kuti performs the following moves to solve the permutation of his corners:

U'2 R'2 U' R2 U R2 U y' R'2 U R2 U' R'2 y U L'2 U L'2 U' L'2 U R U' L' U R' U2
L U' L' U2 L U

After the corners are solved, the edges have again been moved. The algorithms used in this sequence do not follow typical blindfold corner permutation algorithms that only affect the corners. The following table shows the permutation of the edges during the permutation of the corners.

after permutation step?		compared to:	
position	piece	oriented	original
UF	LD		
UL	RD		
UB	RF		SAME
UR	FL		
FL	UR		
BL	UB		
BR	BR		SAME
BF	BL		
FD	UF	SAME	
LD	BD	SAME	
BD	UL	SAME	
RD	FD	SAME	
UFL	UFL		SAME
ULB	ULB		
URB	URB		
URF	URF		
DFL	DFL		
DLB	DLB		
DRB	DRB		
DRF	DRF	SAME	SAME

J permutation at the end of the permutation step right before
U
R U' L' U R' U2 L U' L' U2 L

Only 2 edges are where they were originally, and only four edges remained in place from the corner orientation step.

L' M2 U M U2 M' U M2
L' B2 M2 U' M' U2 U' M2 B2 L2

D' F2 M2 U M U2 M' U M2 F2
 M' M x U L' U' x' M2 U M U2 M' U M2 x U L U' x'
 L' M2 U M U2 M' U M2 L
 R R'2 U R U R' U' R' U' R' U R'2

The following table shows the permutation of the edges:

solving edges		
L'	UR -> FL ->	
	UF	M2 U M U2 M' U M2
	UR -> LD ->	
L' B2	BD	M2 U' M' U2 M U' M2
B2 L2		
D' F2	UR -> UL ->	
	RD	M2 U M U2 M' U M2
	F2 D	
M' M		
x U L' U'	UR -> FD ->	
x'	UF	M2 U M U2 M' U M2
x U L' U'		
x'		
y L'	UB -> RF ->	
	UL	M2 U M U2 M' U M2
L y		
R	RF -> UF ->	R R2 U R U R' U' R' U' R' U
	UL	R'
R'		

An applet showing a recreation of the solve is produced here:

<http://www.cubomagico.110mb.com/kuti.html>.

Similar analysis was done on the first solve from the Czech Open and is produced here:

http://archive.garron.us/solves/2007/matyas_BLD_54_83.htm.

In addition to this, analysis has been done on video of a 5x5x5 blindfolded solve and on video of a multiblind solve. The information gathered from this analysis is similar. The importance of this information is stronger, because applying the strategy for large cube blindfolded solving and multiple blindfolded solving is harder because of the higher number of pieces to track.

Two reconstructions were shown to Kuti, and he said they were probably correct and that the method shown is the one used by him.

4.2.1 Definitive proof of cheating

The definitive proof that Kuti cheated during World Championship 2007 comes from the second cube of the 15 cubes that Kuti solved in the multiple blindfolded event.

Video: <http://www.youtube.com/watch?v=hyEbkrjTeag>

Reconstruction: <http://solvethecube.110mb.com/kuti.htm>

We are referring to the phase that is shown from 4:00 to 4:40 of the video. What happens is that Kuti messes up several pieces by mistake (wrong inverse of set-up moves), then he

starts looking around the cube, notices that he made a mistake, then starts solving the corners again, while leaving the edges completely messed up. This is only possible if he cheated, because if he had known otherwise that he had made a mistake, then he would have undone the wrong moves instead.

This is proof beyond any doubt that Kuti cheated during World Championship 2007.

4.2 Analysis of success rate of blindfolded solves

The algorithms used by Kuti at his corner orientation give him a big advantage, as they are much shorter than common algorithms used in blindfold methods that retain the positions of the other pieces. But, because he changes the edge and corner positions during the orientation phase, his average success rate was expected to be similar or lower than the one of other world-class competitors, who use less complicated systems. Instead Kuti never had an unsuccessful blindfolded solve for Rubik's Cube in 31 attempts for single cube solving and 46 Rubik's Cubes in multiple blindfolded solves, until Belgian Open 2008.

In Belgian Open 2008 it was the first time that a paper sheet was held in between Kuti's face and the cube during the complete solving phase. Immediately he had 2 unsuccessful solves and 1 unsuccessful multiple blindfolded solve.

4.3 Analysis of unsuccessful blindfolded solves

Kuti informed the WCA that the unsuccessful solves of Belgian Open 2008 were not the effect of better cheating prevention, but of the fact that his wallet was stolen that day. Kuti told another cuber that he had picked up the cube with the wrong orientation. The video analysis shows that this was not the case.

For the second solve Kuti said that he used a new system, that he had not practised. The video analysis shows indeed that he uses a different system than shown on the successful solves.

4.4 Analysis of behaviour after allegations of cheating

Other remarkable behaviour of Kuti was:

- 1) Kuti had not talked with his parent(s) about the accusations, even after advice of WCA to do this. In the end WCA decided to contact Kuti's mother to inform her about the accusations and asked her to talk to Kuti.
- 2) Kuti initially did not cooperate with WCA to investigate the accusations.
- 3) Kuti had not been visible online, where normally he was online quite frequently;

4.5 Conclusion of the analysis

The WCA concludes that the analysis proves beyond any doubt that Kuti performed several blindfolded solves with visual aid by looking beneath the blindfold.

5. Actions by the WCA

The WCA's investigation of these allegations took place during the week from February 11 to February 14. Kuti failed to exercise the most minimal of efforts in order to support his case leaving the WCA with many inconsistencies throughout the investigation. Many questions posed by the WCA to Kuti were ignored, and Kuti did not grasp the severity of these allegations.

The WCA offered Kuti the opportunity to show his system and his accuracy during the Benelux Open 2008 in on February 16-17 in The Netherlands. In order to provide evidence in support of his claim, Kuti would have been required to solve Rubik's Cubes blindfolded with approximately 15 seconds of memorisation while performing OLL algorithms from the CFOP method to orient the corners of the cube. He would then need to complete the cube without any major pauses.

It should be noted that future accomplishment does not affect past results.

Kuti had already planned the trip, made a hostel reservation and bought the airplane ticket to travel to the Benelux Open 2008. The day before departure Kuti suddenly decided to cancel his trip the day before his flight, citing emotional reasons. In a chat room with WCA board members Roux, van Bruchem, and Mao, Kuti asked for the opportunity to prove his innocence at the Benelux Open. It was under the impression of the WCA that Kuti had planned to attend the Benelux Open. Upon being informed that he would be subject to testing prior to the competition, Kuti abruptly reversed his decision to attend.

The WCA finds many aspects of Kuti's behaviour and testimony inconsistent. WCA not only find his blindfold solves to be fraudulent, but raise concerns over his moral development.

6. Verdict

The following actions will be taken by the WCA in light of the above analysis.

1. Kuti's records in all blindfold events will be expunged. His speed solve statistics will still be considered valid as the WCA accepts these solves being performed in accordance to WCA regulations.
2. Kuti will return 2,000 Euros to SevenTowns. This is the prize money earned from the World Championships 2007 in Budapest, Hungary by taking first prizes in the 3x3x3 blindfold event, 3x3x3 multi-blindfold event, and 4x4x4 blindfold event.
3. Upon returning the prize money, Kuti will be banned from competing in any WCA sanctioned event for 36 months.
4. Kuti may appeal to the WCA for reinstatement after 24 months upon returning the prize money from the World Championships 2007 in Budapest, Hungary.

5. The WCA will issue temporary regulations to address possible deficiencies in the regulations, and will work to create a permanent remedy for the blindfold solving procedures.

The WCA is disappointed in Kuti's lack of cooperation with this investigation. WCA believe he is a tremendous talent and has contributed monumentally to the motivation of Rubik's Cube enthusiasts around the globe. WCA understand Kuti is young, and hope this time off from WCA events can be spent for his own personal growth and development, and WCA is confident upon serving the provisions set forth, he will return to the competition scene with amazing results, and a matured sense of morality and integrity.

The WCA recommends of Baticz that official complaints of WCA regulation violations be brought up in private with the WCA, so as to avoid the heated and frequently irrational debates in the online community. WCA urges the online community to extend offers of peace, and WCA hopes that the international organisation will continue to promote our passion.

In conclusion, the WCA would like to extend congratulations. Danyang Chen of China is recognised as the current record holder for the 3x3x3 blindfold event. Chris Hardwick of the United States now holds the records for the 4x4x4 and 5x5x5 blindfold events. Dennis Strehlau of Germany holds the world record for 3x3x3 multiple blindfold.

Numerous competitors will now find their ranking in specific competitions updated. Notably, WCA would like to extend our apologies to Sinpei Araki, Tyson Mao and Yumu Tabuchi for previously placing fourth, and Chris Hardwick and Rafal Guzewicz, for previously placing second in their respective competitions at the World Championships 2007 in Budapest. It was a great honour for those who had the privilege to stand before the international community on the podium. WCA thanks you for your understanding, and recognises you for your accomplishments.

7. Conclusion

The verdict is a very difficult decision by the WCA, but an organised sport is meaningless if its rules are not enforced. WCA would like to extend gratitude to everyone who assisted in this investigation.

This concludes the investigation. A question and answer session via IRC chat will be scheduled in the upcoming month, and notification will be sent through the international forums.

Respectfully,

Tyson Mao
WCA Board Member – North and South America
United States of America